REMARKS

Claims 1-13 and 17-20 are pending. Claims 1, 17 and 18 are amended.

Claims 1-9, 13 and 17-20 were rejected under 35 USC §103(a) as being unpatentable over Chen et al. or Shiotani et al. in combination with newly cited JP54-066966 (JP '966). This rejection is respectfully traversed.

JP '966 is applied by the Examiner for its disclosure of forming a laminate which is aged at a temperature of drying to ordinary temperature for a long time. The abstract indicates that the aging is conducted "without degrading bond strength."

The Examiner argues that it would have been obvious to combine the teachings of the cited references and to perform a subsequent aging step as taught by JP '966 "with the expectation of achieving a superior bond between the polyimide and the metal layers."

Independent claims 1, 2, 3 and 17 all require heating so that the adhesive strength between the thermoplastic polyimide and the conductor layer is enhanced. Newly cited JP '966 teaches aging "without degrading bond strength." JP '966 does not provide any teaching or suggestion of increasing adhesive strength by heating.

JP '966 discloses that, in the production of a flexible, composite sheet comprising a metal foil and a plastic layer by cast-coating a heat-resistant polymer solution on a metal foil, followed by drying and solidifying the solution, the composite sheet is ripened for an extended period of

time at a temperature range lying between the drying solidification temperature or lower and at an ordinary temperature or higher.

As a noticeable statement, in the left lower column, lines 2 to 9 of page 369 of JP '966, there is described that "In addition, for example, when the ripening is conducted under the temperature and temporal conditions as mentioned above, some degree of discoloration occurs at the surface of the copper foil adhering to the heat-resistant plastic layer in some cases. And depending on the case conditions, the adhesion strength between the heat-resistanc plastic layer is reduced slightly. But such reduction could be avoided conducting the ripening in an inert atmosphere comprising an inert gas such as nitrogen or in vacuum."

This statement means that, though "the ripening" usually acts to deteriorate adhesion, such deterioration can be avoided by selecting the ripening conditions. Actually, in Example 1, about 20% of adhesion strength is reduced.

Even if "the ripening" corresponds to "the heating of the resulting laminate" of the present invention, those skilled in the art naturally consider, when they read the description, that application of any thermal treatment to the resulting laminate adversely affects adhesion, and further that some means is necessary in order to prevent the deterioration of adhesion. Thus, it is evident that "the ripening" is not recognized as a process for adhesion enhancement.

An English translation of lines 2 to 9 of page 369 (as above) and Example 1 of JP '966 is attached.

The key features of the present invention are:

(1) To obtain a laminate by directly bonding a conductor layer on the surface of a thermoplastic polyimide, and

(2) To heat the resulting laminate so as to enhance the adhesion of the thermoplastic polyimide to the conductor layer.

The difference from the cited documents lies in the fact that the conductor layer, which has been directly formed on the surface of the thermoplastic polyimide, is already attached to the thermoplastic polyimide prior to the heat treatment.

Any of Chen, Shiotani, JP 62-60640 and JP 11-240106 does not disclose the enhancement of the adhesion of the thermoplastic polyimide with the conductor layer by heating the laminate obtained by forming a conductor layer on a polyimide resin layer.

In order to further emphasize that a polyimide film is initially provided onto which a conductor layer is formed, claims 1, 17 and 18 are hereby amended to specify a thermoplastic polyimide film. It should be clear by this amendment that a thermoplastic polyimide film or a polyimide laminate having a thermoplastic polyimide surface on the substrate is already formed prior to the formation of the conductor layer.

There would have been no motivation to combine the teachings of JP '966 with Chen et al. or Shiotani et al. Each of Chen et al. and Shiotani et al. laminate a metal sheet or foil onto a polyimide film. In contrast, JP '966 applies a polymer solution to a metal foil, followed by aging at a specific temperature for a long time. Thus, there would appear to be no reason for one of

ordinary skill in the art to have been motivated by the teachings of JP '966 to conduct additional heating since the polyimide films of Chen et al. and Shiotani et al. have already been formed.

Independent claim 18 requires that a thermoplastic polyimide is provided, followed by forming a conductor layer directly adhering with said at least one surface. Since JP '966 does not provide a thermoplastic polyimide film onto which a conductor layer is formed, a combination of Chen et al., Shiotani et al. and JP '966 would not teach the limitations of claim 18.

Claims 1, 3-11, 13 and 17-20 were rejected under 35 USC §103(a) as being unpatentable over JP '640 or JP '106 in combination with JP '966. Applicants traverse this rejection for the same reasons discussed above. More specifically, each of JP '604 and JP' 106 disclose laminating or sputtering metal onto a thermoplastic polyimide. In contrast, JP '966 applies polymer solution to metal foil. The teachings of JP '966 would not have motivated one of ordinary skill in the art to perform a subsequent aging step "with the expectation of achieving a superior bond between the polyimide and the metal layer" as asserted by the Examiner.

Claim 12 was rejected is rejected under 35 USC §103(a) as being unpatentable over JP '640, Chen et al., Shiotani et al. or JP '106 in combination with JP '966 and Ameen et al. This rejection should be overcome for the same reasons discussed above.

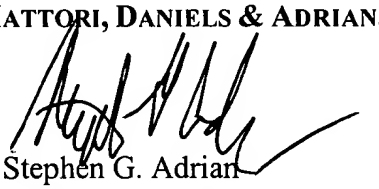
For at least the foregoing reasons, the claimed invention distinguishes over the cited art and defines patentable subject matter. Favorable reconsideration is earnestly solicited.

Should the Examiner deem that any further action by applicants would be desirable to place the application in condition for allowance, the Examiner is encouraged to telephone applicants' undersigned attorney.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP



Stephen G. Adrian
Attorney for Applicants
Registration No. 32,878
Telephone: (202) 822-1100
Facsimile: (202) 822-1111

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Attachments: English Translation of JP 54-066966
Petition for Extension of Time